
Installation and administration

This chapter describes the installation of the NTAG36 Meridian Integrated RAN (MIRAN). It describes how to install the MIRAN, how to connect it to a terminal for a terminal-based OA&M access, and how to connect the external analog sources for recorded announcement (RAN) and music-on-hold (MOH) to the MIRAN. It also describes the basic administration procedures used to maintain, modify, and expand the MIRAN functions.

Installation overview

The RAN service can be added to existing Meridian 1 system options 21E, 51, 51C, 61, 61C, 71, 81, and 81C as well as Options 11E, 11C and SL-1 systems that supports IPE and Enhanced Universal Trunk cards, originally installed and operating without MIRAN, or it can be an integral part of a newly installed Meridian 1 system.

The installation of the MIRAN into the Meridian 1 should begin after:

- A previously installed Meridian 1 system is upgraded to run on generic software X11 release 20 or higher, if multi-channel RAN control mode is not required. If multi-channel RAN control mode is required, the system must be running on generic software X11 release 21.41 or higher, or X11 release 22.16 or higher. For more information, refer to “Multi-channel level start/stop control RAN” on page 65.
- A newly installed system using the latest generic software X11 release 22.16 or higher.

To install a new Meridian 1 system or expand an existing one, refer to *Meridian 1 system installation procedures* (553-3001-210). It provides the information on how to install, verify, and maintain the Meridian 1 system.

To complete the installation of a MIRAN, you should follow the general procedures listed below.

These procedures include:

- Preparing the site
- Unpacking, inspecting, and taking inventory of the equipment
- Installing the MIRAN card in the selected IPE card slot, if not already installed
- Installing the cables between the MIRAN faceplate connectors and external devices, if required
- Installing the cables between the backplane connectors on the IPE module and the I/O panel connectors at the rear of the module, if required
- alternately installing the cables at the MDF to connect external devices to the MIRAN
- Connecting multiple MIRAN cards in a daisy-chain, if required

Installation preparation

The preparation consists of unpacking and inspecting components, taking inventory, and locating the IPE card slots where the MIRAN will be installed.

Unpacking and inspection

Unpack and inspect the equipment for damage. When unpacking, follow general precautions recommended by computer and telephone equipment manufacturers:

- Remove items that generate static charge from the installation site.
- Use antistatic spray if the site is carpeted.
- Ground yourself before handling any equipment.
- Remove equipment carefully from its packaging.
- Visually inspect the equipment for obvious faults or damage. Any damaged component must be reported to your sales representative and the carrier who delivered the equipment.

Taking inventory

After the equipment has been unpacked and visually inspected, verify that all the equipment is at the site before the installation begins. Equipment received must be checked against the shipping documents. Any shortages must be noted and reported to your sales representative.

Locating the card slot

A MIRAN card can be installed in any IPE card slot in an IPE module or shelf that has a 25-pair tip/ring cable connected between the backplane and the I/O panel. The only card slot that cannot be used is the Peripheral Controller card slot labeled *Cont.*

In Options 11E and 11C cabinet, the MIRAN card can be installed in any IPE card slot from 1 to 9 (card slot 10 is not used for MIRAN installation).

Note: If the backplane RS-232 connections are used, the MIRAN card cannot be installed in IPE card slots 3, 7, 11, or 15, since the required tip/ring pairs in these slots are not available at the MDF.

Verifying MDF wiring

The MIRAN interfaces appear on the IPE module's backplane. The backplane is cabled to the input/output (I/O) panel at the rear of the IPE module, which is then connected to the Main Distribution Frame (MDF) by the 25-pair cable.

Trunks connect to the two MIRAN multi cross-connect channels at the MDF, as shown in Table 9. The two MIRAN multi cross-connect channels wiring is shown in Figure 10.

CAUTION

Do not install a MIRAN card into IPE card slots that are wired for line cards. Line cards are configured with ringing voltage, which, when applied to MIRAN, may damage the card.

Table 9 lists the 25 tip/ring pairs for the MIRAN card installed in the IPE module. It shows the wire color code at the MDF to facilitate cross-connect to the external terminal equipment or trunk tip/ring pairs.

Table 9
NT8D37 IPE Module MIRAN pair termination (I/O panel to MDF cable)

Pair	Pin No	Pair color	MIRAN Assignment
1T/1R	26/1	W-BL/BL-W	RANAT0/RANAR0
2T/2R	27/2	W-O/O-W	CNTRPLS0/GRD
3T/3R	28/3	W-G/G-W	RANAT1/RANAR1
4T/4R	29/4	W-BR/BR-W	CNTRPLS1/GRD
5T/5R	30/5	W-S/S-W	AGRD/AGRD
6T/6R	31/6	R-BL/BL-R	No connection
7T/7R	32/7	R-O/O-R	AIN1/AIN0
8T/8R	33/8	R-G/G-R	AIN3/AIN2
9T/9R	34/9	R-BR/BR-R	No connection
10T/10R	35/10	R-S/S-R	Reserved
11T/11R	36/11	BK-BL/BL-BK	Reserved
12T/12R	37/12	BK-O/O-BK	Reserved
13T/13R	38/13	BK-G/G-BK	Reserved
14T/14R	39/14	BK-BR/BR-BK	Reserved
15T/15R	40/15	BK-S/S-BK	Reserved
16T/16R	41/16	Y-BL/BL-Y	BDCDA-/Reserved
17T/17R	42/17	Y-O/O-Y	BSOUTA-/BSINA-
18T/18R	43/18	Y-G/G-Y	SGRD/BDTRA-
19T/19R	44/19	Y-BR/BR-Y	BRTSA-/BDSRA-
20T/20R	45/20	Y-S/S-Y	BSINB-/BCTSA-
21T/21R	46/21	V-BL/BL-V	BDCDB-/BSOUTB-
22T/22R	47/22	V-O/O-V	BDSRB-/BDTRB-
23T/23R	48/23	V-G/G-V	Reserved
24T/24R	49/24	V-BR/BR-V	Reserved
25T/25R	50/25	V-S/S-V	spare

Note: Each of the following I/O panel connectors is cabled as shown above: connectors A, B, C, D, E, F, G, K, L, M, N, R, S, T, and U. These connectors are associated with card slots 0 through 15 in the IPE module.

Identifying multi cross-connect channels at the MDF

The MIRAN external multi cross-connect channels are routed from the IPE module backplane to the MDF over the 25-pair tip/ring cable. These two cross-connect channels can be connected up to a maximum of 32 trunks (or to 16 each) at the MDF providing 32 RAN and MOH application channels.

Table 10 lists the NTAG36 MIRAN card pair termination for the two external cross-connect channels that connect to multiple trunks. It lists the pinout and the cable wire color code for the two MIRAN external channels. Each of these two external MIRAN channels can cross-connect to up to 16 trunks for a total of 32 RAN channels.

Table 10
NT8D37 IPE Module: NTAG36 MIRAN external cross-connect channels

MIRAN Pair	25-pair cable Pin No	Pair color code	MIRAN Port
1T/1R CP/MB	26/1 27/2	W-BL/BL-W W-O/O-W	A0
3T/3R CP/MB	28/3 29/4	W-G/G-W W-BR/BR-W	A1
Note: The MIRAN has 8 internal one-to-one ports/channels (0-7) and two external multi cross-connect channels (A0 and A1).			

Figure 10 illustrates connection of the two MIRAN external multi cross-connect channels from the IPE module I/O panel to the MDF cross-connect terminals and from the MDF to the multiple trunks for Enhanced Universal Trunk wiring.

Figure 10
MIRAN multi cross-connect channels relative to the EXUT wiring

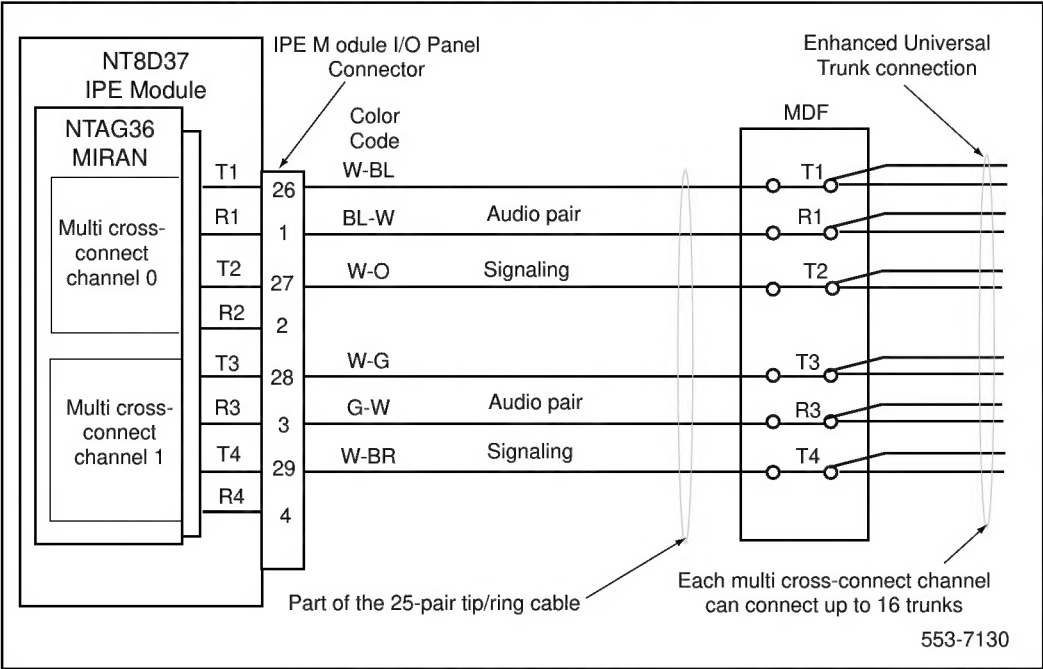
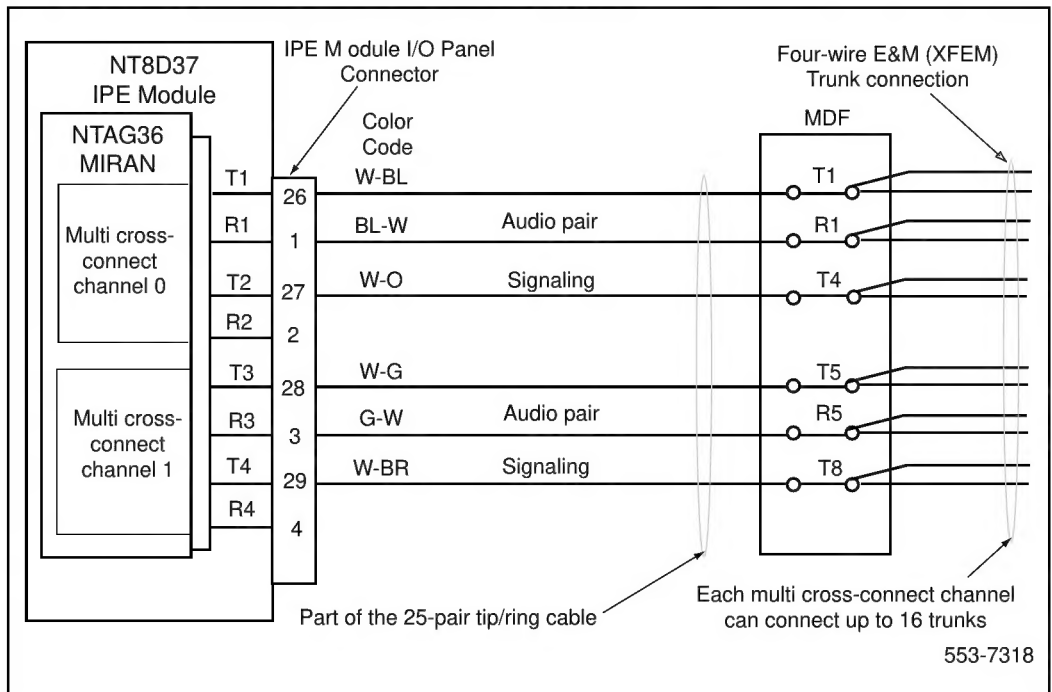


Figure 11 illustrates a connection of the two MIRAN external multi cross-connect channels from the IPE module I/O panel to the MDF cross-connect terminals and from the MDF to the multiple trunks for 4-Wire E&M trunk wiring.

Figure 11
MIRAN cross-connect channels relative to the XFEM wiring



MIRAN equipment installation

The installation of the MIRAN and the external equipment connections associated with the MIRAN should start after:

- verifying that the preinstallation preparation has been completed (this includes verifying that all the equipment has been received undamaged, that the IPE module has 25-pair cables connected from the backplane to the I/O panel and from there to the MDF)

- planning you MIRAN equipment, port and memory capacity, and external equipment connection configuration using *Engineering guidelines* in the *Description* section of this document
- procure external connection cables not provided with Nortel equipment, if required (these are cables that connect the terminal and external analog sources to the MDF cross-connect instead of the MIRAN faceplate)

These three items provide the foundation for a efficient and accurate installation of the MIRAN hardware.

Installing MIRAN cards into the IPE module

Before you install the card inspect the IPE module or cabinet I/O panel or backplane cabling.

CAUTION

Do not install a MIRAN card into an IPE card slot if that card slot has been configured for a line card. Before you insert the card into the card slot, disconnect the cable connecting this card slot to the MDF. Line cards are configured with ringing voltage, which, when applied to MIRAN, may damage the card.

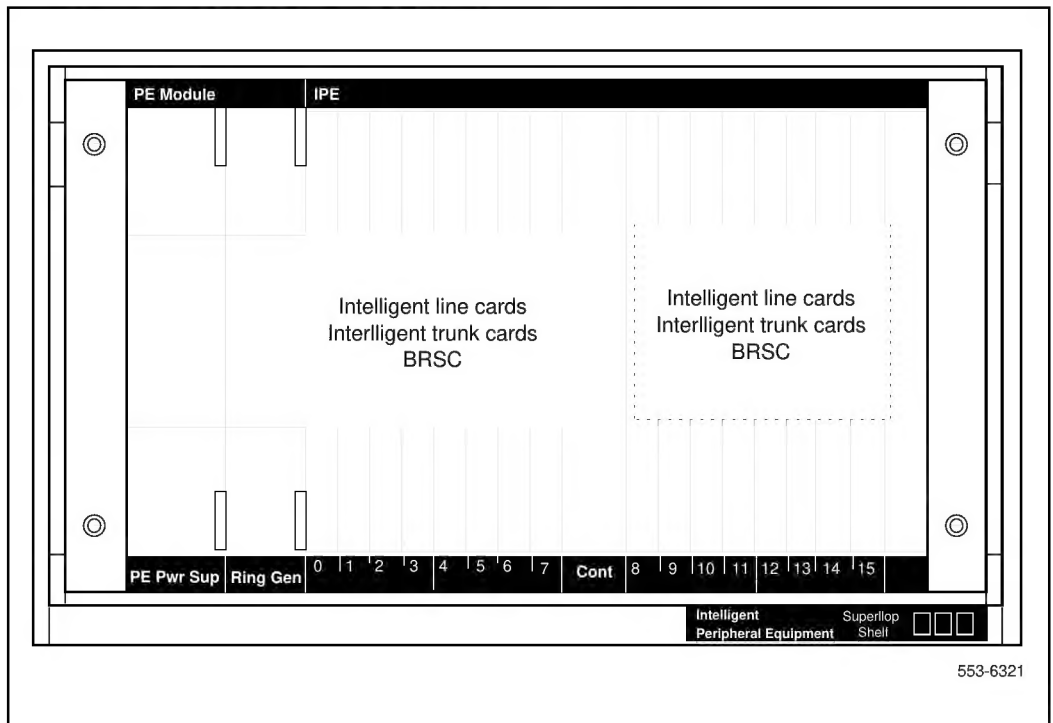
When installing MIRAN cards, follow the steps bellow:

- 1 Identify the IPE card slots selected for MIRAN card(s)
- 2 Pull the top and bottom extractors away from the MIRAN faceplate.
- 3 Insert the MIRAN card into the card guides and gently push it until it makes contact with the backplane connector.
- 4 Push the top and the bottom extractors firmly towards the faceplate to insert the MIRAN card into the faceplate connector and to lock it firmly in place.
- 5 Observe the faceplate hexadecimal display. It should indicate the progress of the internal self-test in the form of **T:xx** (refer to *Appendix A, MIRAN hexadecimal codes*). Upon successful completion of the test and the start-up of the RAN application, it will display the code "**Rann**", where **nn** is the LAN card number. If cards are not connected in a LAN configuration the display will show **Ra00**.

- 6 To enable the MIRAN, load the Network and PE Diagnostic program LD 32 into the system memory using the system TTY to execute the **ENLC l s c** command, where **l** is the loop, **s** is the module or shelf, and **c** is the card to be enabled.
- 7 Repeat steps 1 through 6 for each additional MIRAN.

Figure 12 shows the IPE module and the card slots used by the IPE cards. A MIRAN card can be installed into any IPE card slot except the Peripheral Controller card slot *Cont*.

Figure 12
MIRAN installed in an NT8D37 IPE module



Connecting a terminal to the MIRAN in the IPE module

A terminal connected to the MIRAN is used for terminal-based OA&M access. It can be connected:

- to the RS-232 mini-DIN connector on the MIRAN faceplate, or
- at the MDF

Connecting the terminal to the faceplate connector

The MIRAN has an 8-pin mini-DIN connector at the bottom of the faceplate. This connector provides two RS-232 ports. These two ports are used to connect a terminal and to interconnect multiple MIRAN cards into a daisy-chain where one terminal can service all the MIRAN cards in the chain. This connection is simple and is preferred for occasional use of the terminal. For a permanent connection, use the MDF to connect the terminal to the MIRAN, as described in the next procedure (Connecting the terminal to the MDF):

To connect the terminal or a personal computer emulating a terminal to the 8-pin mini-DIN connector on the MIRAN faceplate:

- 1** Place the terminal in the desired location. If the distance to the MIRAN is less than 10 feet, you will not need an extension cable.
- 2** Select the NTAG81CA Maintenance cable and plug its 8-pin mini-DIN male connector into the MIRAN 8-pin mini-DIN female connector located at the bottom of the faceplate.
- 3** Plug the NTAG81CA cable 9-pin D-Subminiature female connector into the terminal. If the terminal requires a different connector, procure an adapter cable or a compact adapter and install it between the terminal and the NTAG81CA cable.
- 4** If the terminal is more than 10 feet away from the MIRAN, use the 16-foot NTAG81BA Maintenance Extender Cable, or use an adapter cable of the appropriate length, if the terminal requires a different connector.

Connecting the modem to the faceplate connector

To connect a modem to the 8-pin mini-DIN connector on the MIRAN faceplate:

- 1** Place the modem in the desired location.
- 2** Select the NTAG81CA Maintenance cable and plug its 8-pin mini-DIN male connector into the MIRAN 8-pin mini-DIN female connector located at the bottom of the faceplate.
- 3** Plug the NTAG81CA cable 9-pin D-subminiature female connector into the 9-pin D-subminiature male connector of the Modem cable NTAG81DA cable.
- 4** Plug the NTAG81DA cable DB-25 male connector into the DB-25 female connector on the modem.

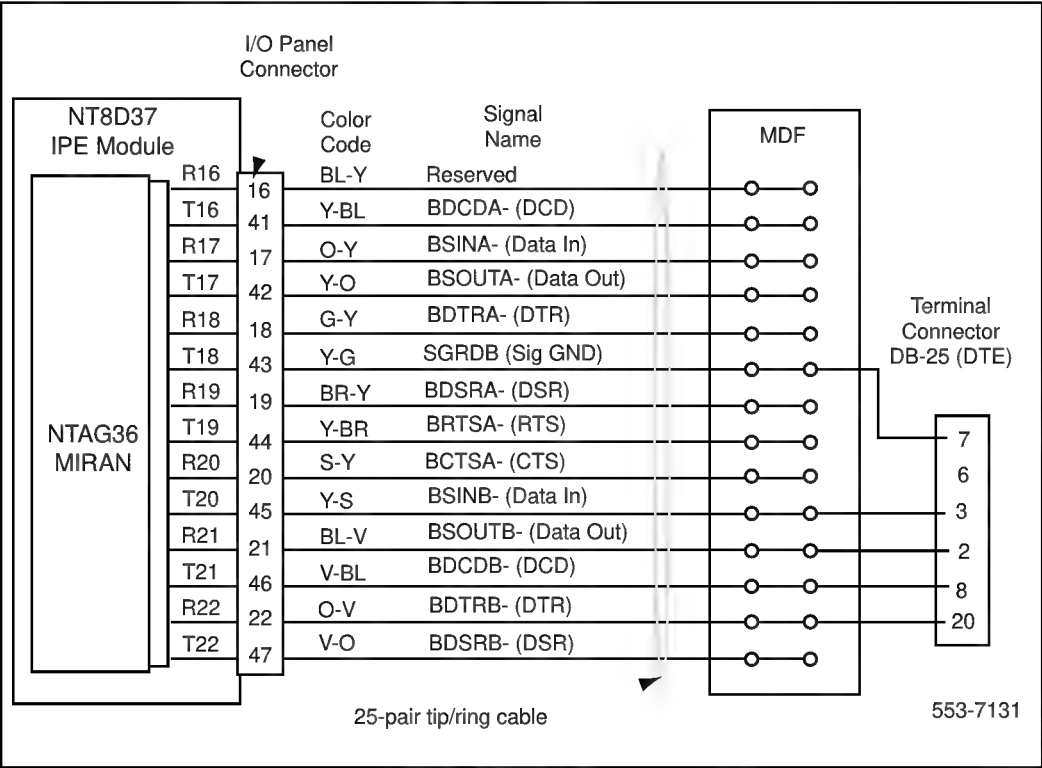
For additional information on how to setup the modem, refer to *Appendix A: Modem setup*.

Connecting the terminal to the MDF

For a permanent connection of a terminal to the MIRAN, connect the terminal to the MDF tip/ring pairs that provide the two RS-232 ports. The total distance from the MIRAN to the MDF and from the MDF to the terminal should not exceed 50 feet.

Figure 13 illustrates the terminal wiring, which starts from the IPE module backplane through the MDF to the terminal. It shows the I/O panel pinout, the 25-pair tip/ring wire color code, the signal description, the terminal cable, and DB-25 terminal connector.

Figure 13
Terminal connection to the MIRAN at the MDF



To connect the terminal or a personal computer emulating a terminal to the RS-232 ports at the MDF, refer to Figure 13 and follow the steps below:

- 1** Place the terminal in the desired location. Place it close to the MDF to minimize the total distance between the MIRAN and the terminal through the MDF. The total distance should not exceed 50 feet.
- 2** Cross-connect the terminal cable at the MDF as shown in Figure 13. Observe the cable connector pinout and the cable wire color code. Terminal cable is not supplied with the MIRAN equipment.
- 3** Punch the wires of the terminal cable open end into the MDF punch block according to the Figure 13 wiring diagram.
- 4** Plug the connector at the other end of the terminal cable into the terminal RS-232 connector.

Connecting the modem to the I/O panel connector

To connect a modem to the RS-232 port on the I/O panel connector that corresponds to the MIRAN card slot:

- 1** Place the modem in the desired location.
- 2** Plug the tip/ring 50-pin cable connector into the 50-pin I/O panel connector.
- 3** Plug the DB-25 male connector of the tip/ring cable into the modem DB-25 female connector.

For additional information on how to setup the modem, refer to *Appendix A: Modem setup*.

Connecting an external audio device

An analog audio source and receiver can be connected to the MIRAN for recording of music or messages to the Flash memory on the MIRAN and to backup messages from the MIRAN to a tape or to an other MIRAN card. It can also be used to connect an external music source (CD player or musac) directly through a trunk emulation port/channel, into Meridian 1 for MOH.

The analog sources can be connected:

- to the 3.5 mm Audio Jack on the MIRAN faceplate, or
- at the MDF

Analog to internal pass-through switchover

For Music-on-Hold, both analog channels can be used at the same time, each assigned to different internal channels.

To allow switching from an analog source to an internal channel, the configuration of each channel is polled every 30 seconds to check for an assignment switchover. If the assignment is for a voice file, the playthrough will be stopped and the voice file started immediately, and vice versa. This switchover always occurs at the end of the file to avoid hearing truncated messages.

Connecting audio devices to the MIRAN faceplate

The MIRAN has a 3.5 mm Audio Jack at the top part of the faceplate. This jack provides one audio input and one audio output.

To connect the external audio source to the MIRAN faceplate audio jack:

- 1** Plug the 3.5 mm jack on the common side of the NTAG81AA Audio Cable into the 3.5 mm Audio Jack on the MIRAN backplane.
- 2** Plug the audio input end of the NTAG81AA cable connector into the audio source device. If the source is at a distance from the MIRAN, you may have to use an extension (not supplied).
- 3** Plug the audio output end of the NTAG81AA cable connector into the audio receiver device (for message backup). If the source is at a distance from the MIRAN, you may have to use an extension (not supplied).

Connecting audio devices at the MDF

The MIRAN provides two audio inputs and two audio outputs at the MDF.

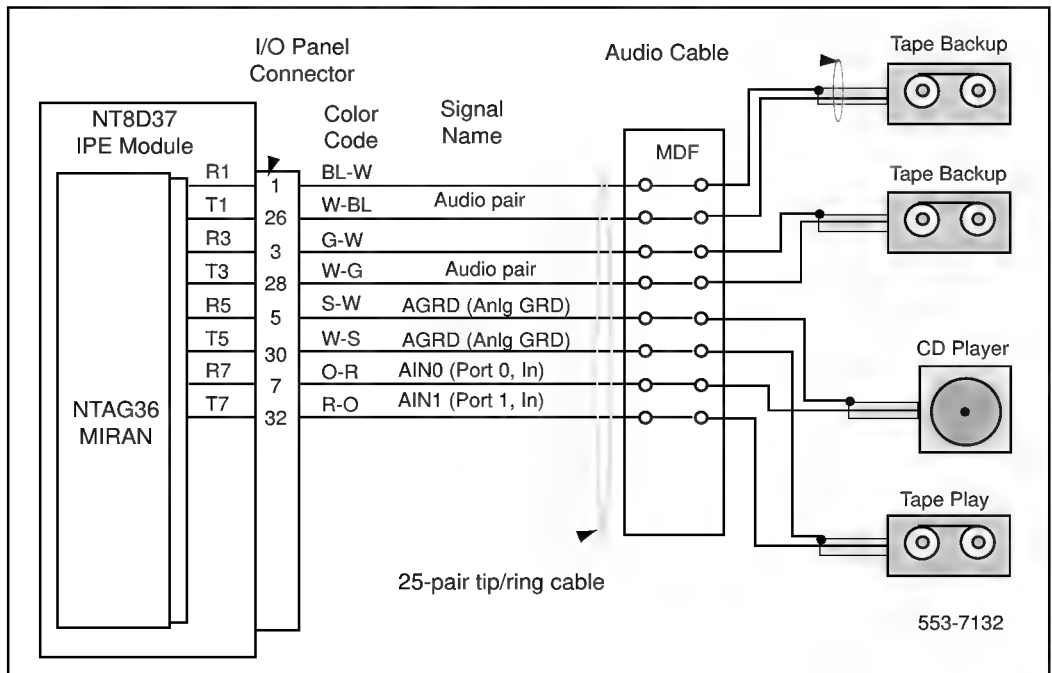
To connect the external audio devices at the MDF, refer to Figure 14 and follow the steps below:

- 1** Position the audio devices in a convenient location.
- 2** Obtain the required audio cables of the appropriate length. The cable should have open wires at one end to connect to the MDF punch block.

- 3 Connect each audio cable to the appropriate Analog GND and Port terminal on the MDF. Refer to Figure 14 for signal name and color code of the 25-pair tip/ring cable wires.
- 4 Plug the other end of each audio cable into the appropriate audio device, as shown in the figure.

Figure 14 illustrates the external audio source and backup device connections at the MDF. It shows two audio inputs that provide external music or messages to the MIRAN and two audio recorders that provide backup of messages located in the MIRAN. Analog audio sources have a separate analog ground (AGND) and analog audio backup devices have their own separate (AGND). An audio cable extends from the MDF to the audio device.

Figure 14
Analog device connection at the MDF



Connecting multiple MIRAN card

A maximum of 16 MIRAN cards can be connected in a daisy-chain to form a MIRAN Local Area Network for administration and maintenance purposes.

These MIRAN card can be inter-connected:

- at the mini-DIN connector on the MIRAN faceplate, or
- at the MDF

Connecting multiple MIRAN cards at the faceplate

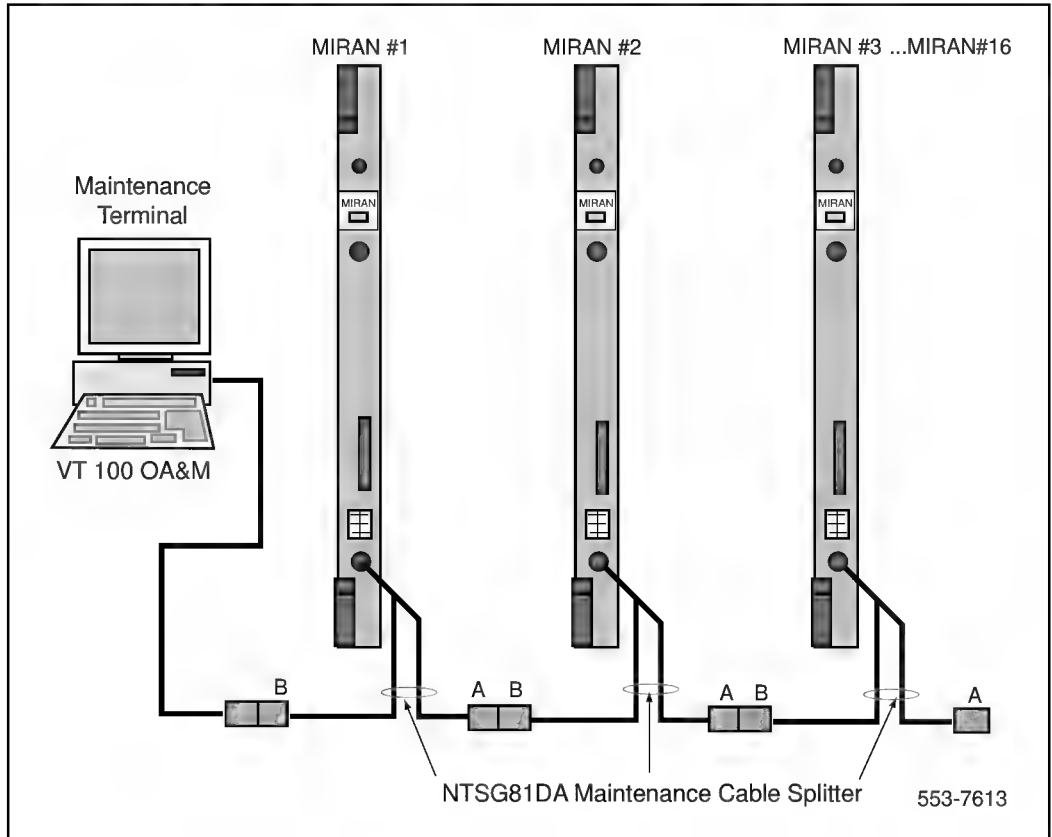
All of the MIRAN cards in the system are connected in a daisy-chain using the NTAG81DA Maintenance Cable Splitter cable with a mini-DIN connector on the common end and two 9-pin D-Sub connectors on the other ends.

To install the MIRAN cards and connect them in a daisy-chain:

- 1** Install all the MIRAN cards into their card slots in the IPE module or shelf, if not already installed.
- 2** Plug the NTAG81DA cable mini-DIN connector into the mini-DIN connector on the MIRAN faceplate. Do this for every MIRAN installed.
- 3** Plug the NTAG81DA cable Port B 9-pin sub-min D-type male connector of the first MIRAN into the terminal, terminal emulating PC, or a modem. Use the appropriate adapter cable, if required.
- 4** Plug the NTAG81DA cable Port A 9-pin sub-min D-type female connector of the first MIRAN into the NTAG81DA cable Port B 9-pin sub-min D-type male connector of the second MIRAN. Refer to Figure 15.
- 5** Repeat steps 3 and 4 for the rest of the MIRAN cards in the daisy-chain.
- 6** If MIRAN cards occupy the same module or shelf, the faceplate cables can be connected directly to each other as shown in Figure 15. For longer runs, the NTAG81BA Maintenance Extender cable may be required to span the distance.

Figure 15 illustrates the multiple MIRAN connections in a daisy-chain to enable one terminal to access each MIRAN in the chain. A maximum of 16 MIRAN cards can be daisy-chained into a LAN.

Figure 15
Terminal-based OA&M connection for multiple MIRAN cards



Connecting multiple MIRAN cards at the MDF

A maximum of 16 MIRAN cards can be connected in a daisy-chain at the MDF. This is a more convenient approach than the connection at the MIRAN faceplate because it allows MIRAN cards to be removed without disconnecting any cables.

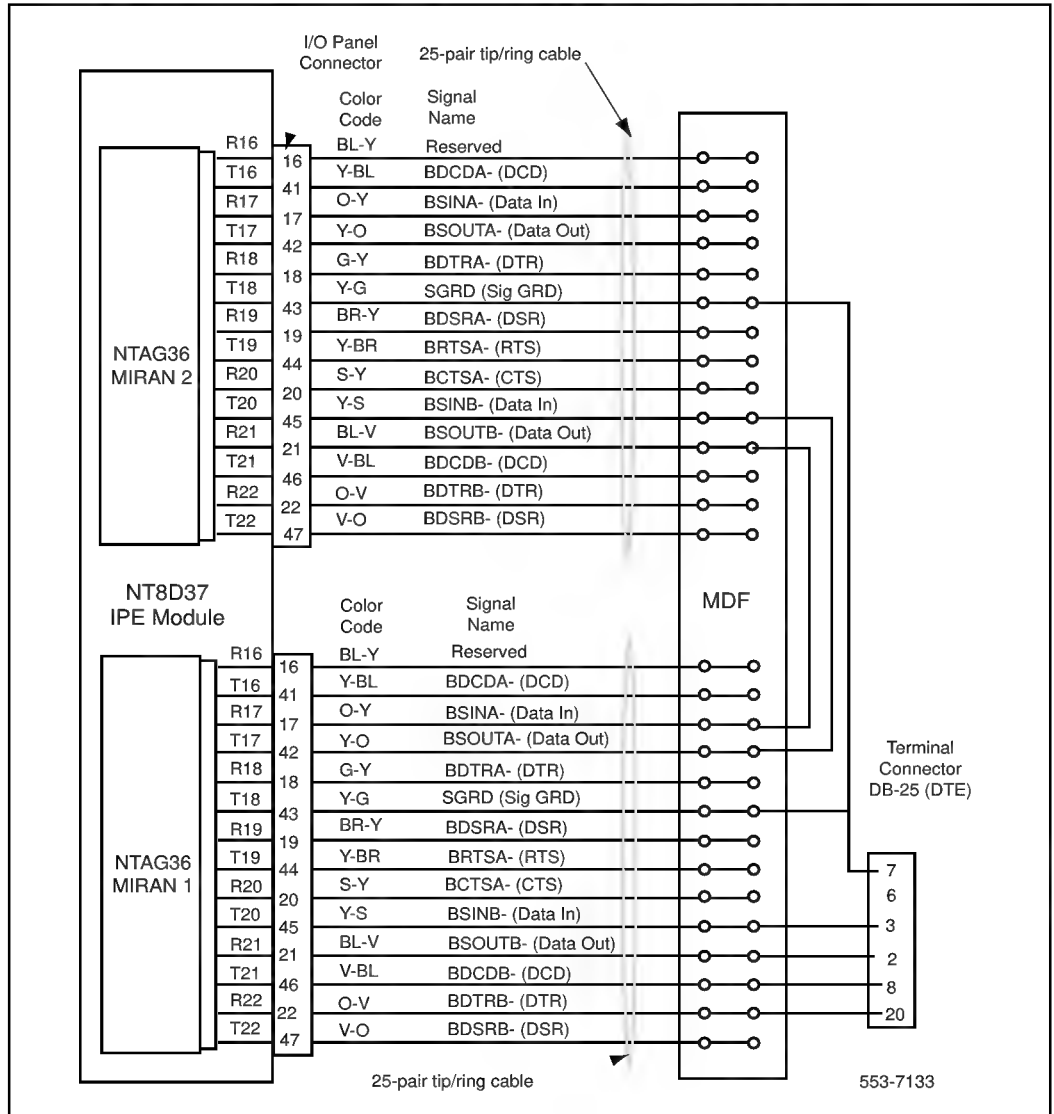
Note: If you remove a MIRAN card from the daisy-chain, all the remaining cards down-stream from the removed card, cannot be accessed by the administration and maintenance terminal. All the cards that are up-stream, towards the terminal, will continue to be accessed by the terminal. Once the card is re-installed, all cards can be accessed.

To connect MIRAN cards in a daisy-chain at the MDF:

- 1** Install all the MIRAN cards into their card slots in the IPE module or shelf, if not already installed.
- 2** Identify each 25-pair tip/ring cable at the MDF that is associated with each MIRAN card. These cables have been installed during system installation or in the pre-installation preparation phase.
- 3** Cross-connect the wires at the MDF punch block that represent the RS-232 maintenance Port A and Port B as shown in Figure 16:
 - Connect the terminal to the first MIRAN in the daisy-chain as shown in Figure 13 “Terminal connection to the MIRAN at the MDF” on page 52 by plugging the Port B 9-pin sub-min D-type male connector of the first MIRAN to the terminal cable.
 - Cross-connect Port A 9-pin sub-min D-type female connector of the first MIRAN to Port B 9-pin sub-min D-type male connector of the second MIRAN in the chain, as shown in Figure 16.
 - Continue cross-connecting Port A to Port B until the last MIRAN in the daisy-chain.
 - Port A on the last MIRAN is not connected.

Figure 16 illustrates the connection of multiple MIRAN cards over RS-232 interfaces at the MDF by cross-connecting Port A to Port B of MIRAN cards.

Figure 16
Multiple MIRAN card connections over the RS-232 port at the MDF



Option 11E/11C MIRAN installation and terminal connection

Options 11E and 11C system uses a pass-through approach to connect the TTY and the terminal used for OA&M access.

CAUTION

Do not install a MIRAN card into an IPE card slot if that card slot has been configured for a line card. Before you insert the card into the card slot, disconnect the cable connecting this card slot to the MDF. Line cards are configured with ringing voltage, which, when applied to MIRAN, may damage the card. **Never** install the MIRAN into slot 10.

MIRAN card installation

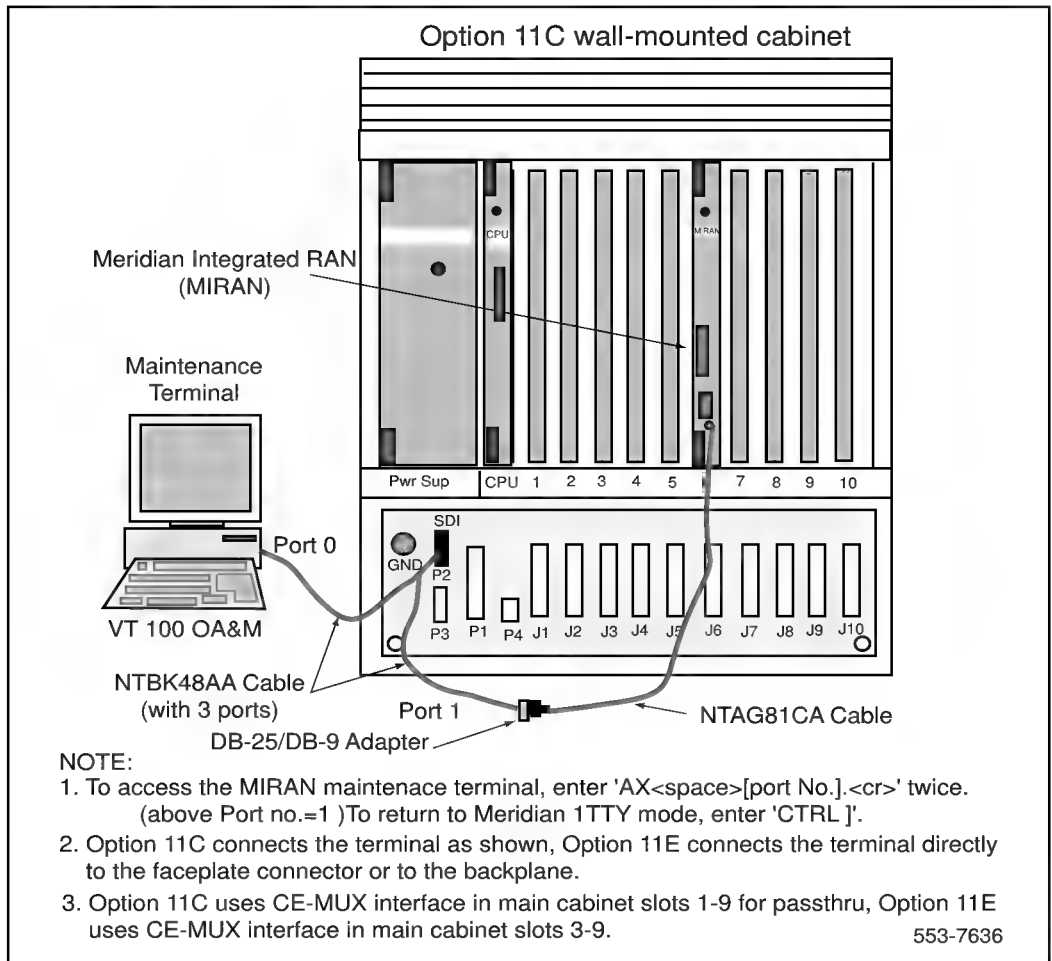
To install one or more MIRAN cards into an Option 11E or 11C system:

- 1 Identify the IPE card slots selected for MIRAN card(s). Slot 10 should never be used to install the MIRAN card. If you are planning to use CE-MUX interface connection for Option 11E, install the MIRAN in a slot from 3 to 9 in the main cabinet.
- 2 Pull the top and bottom extractors away from the MIRAN faceplate.
- 3 Insert the MIRAN card into the card guides and gently push it until it makes contact with the backplane connector.
- 4 Push the top and the bottom extractors firmly towards the faceplate to insert the MIRAN card into the faceplate connector and to lock it firmly in place.
- 5 Observe the faceplate hexadecimal display. It should indicate the progress of the internal self-test in the form of T:xx (refer to *Appendix A, MIRAN hexadecimal codes*). Upon successful completion of the test and the start-up of the RAN application, it will display the code “**Rann**”, where **nn** is the LAN card number. If cards are not connected in a LAN configuration the display will show Ra00.
- 6 To enable the MIRAN, load the Network and PE Diagnostic program LD 32 into the system memory using the system TTY to execute the **ENLC l s c** command, where **l** is the loop, **s** is the module or shelf, and **c** is the card to be enabled.
- 7 Repeat steps 1 through 6 for each additional MIRAN.

Note: During the MIRAN bootup sequence you will see either an error message or an “ok” on the hex display. To interpret an error message, refer to the hex display error codes listed in the Appendix A.

Figure 17 shows the terminal connection to the SDI port on the cabinet backplane and to the Mini-DIN RS-232 connector on the MIRAN faceplate. This allows you to use the terminal as a TTY and as a terminal-based OA&M.

Figure 17
Option 11E or 11C terminal connection



Terminal connection

A terminal connected to the Option 11E or 11C system can be used as a system TTY and the terminal-based OA&M access to the MIRAN card.

To connect the terminal:

- 1 Position the terminal on a desk near the system.
- 2 Plug the NTBK48AA cable DB-9 male connector into the SDI connector on the Option 11E or 11C backplane, refer to Figure 17 for detail connection illustration.

Note: To connect the MSDL SDI port on the Option 11E or 11C to the SDI connector, refer to the *Installation* chapter of the *Multi-purpose Serial Data Link description* (553-3001-195).

- 3 Connect the NTBK48AA Port 0 to the terminal RS-232 port.
- 4 Connect the NTBK48AA cable Port 1 DB-25 connector to the DB-25/DB-9 adapter.
- 5 Plug the NTAG81CA Mini-DIN connector into the MIRAN faceplate Mini-DIN RS-232 connector.
- 6 Plug the NTAG81CA cable DB-9 connector into the DB-9 connector on the DB-25/DB-9 adapter.

MIRAN configuration

Now that you installed the hardware, connected the terminal, connected the multi cross-connect channels to the trunk ports at the MDF, and connected the external audio devices to the MIRAN, you can proceed with the MIRAN configuration.

RAN activation and route selection

In the Meridian 1 system, the MIRAN units are configured exactly the same as the Enhanced Universal Trunk card units are configured for RAN. For detail information of overlays Trunk Route Administration (LD 16) and Trunk Administration (LD 14), refer to *X11 input/output guide* (553-3001-400).

To configure the RAN propagation route and the mode of activating the recorded announcement, you must define its parameters using Trunk Route Administration program LD 16. The MIRAN emulates the Enhanced Universal Trunk characteristics and does not require modification of LD 16 to configure the MIRAN functions.

Specifically, the MIRAN and the Enhanced Universal Trunk card, support the following modes of operation:

- Delay Dial Continuous RAN
- Immediate Start Continuous RAN
- Level Controlled Stop/start RAN

The MIRAN supports all of the above on four or eight totally independent ports/channels. Thus, different parts/channels of the same RAN message can be played to different callers at the same time.

Continuous RAN

Continuous (immediate or delay) RAN plays a message constantly over and over again. Callers “barge in” on a playing message if the immediate start is selected or are provided with a ringback tone until the message begins its next playing, if delay dial is selected in LD 16. At the end of each message, a pulse is issued on the control pulse line that is used by the trunk unit to cut through to the waiting call. External channels barge in at any time during the message, internal ports/channels wait until the message starts to be connected to a RAN message.

Cross-connect channels support only delay dial and immediate continuous RAN mode.

To configure the continuous mode of the RAN activation, load Route Data Block program LD 16 using the system TTY and enter the appropriate responses to the prompts as listed in Table 11.

Table 11
Defines a continuous RAN route

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number
TKTP	RAN	Trunk type recorded announcement (RAN)
RTYP	CON DID	Continuous. DID is selected for telephone-based OA&M access over MIRAN port 7.
REP	1-15	Number of repetitions of RAN
POST	ATT DIS	Route to attendant after maximum repetitions Disconnect after maximum repetitions
STRT	IMM DDL	Immediately connect call to recorded announcement Delay call connection until start of announcement
ASUP	(NO) YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Multi-channel level start/stop control RAN

In the multi-channel level start/stop control RAN, the leading edge of the start signal initiates message playback that continues until either the trailing edge of the start signal occurs or the end of the message is reached. A message that is terminated by the trailing edge of a level start signal is immediately reset and again made available for playback. The multi-channel level start/stop control RAN mode allows you to play the same announcement over multiple RAN channels completely independently using the same RAN route. For an example, refer to “Example 2:” on page 38.

To configure the RAN route, load LD 16 using the system TTY and respond to the prompts as shown in Table 12 with the appropriate parameter selection for your application.

Table 12
Defines a multi-channel start/stop RAN route

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number
TKTP	RAN	Trunk type recorded announcement (RAN)
RTYP	MLSS	Multi-channel start/stop RAN (for X11 release 21.41 and higher and 22.16 or higher)
REP	1-15	Number of repetitions of RAN
POST	ATT DIS	Route to attendant after maximum repetitions Disconnect after maximum repetitions
STRT	IMM	Immediately connect call to recorded announcement
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision for a CO trunk
ACOD	xxx...x	Trunk route access code

Multi-channel Start/Stop RAN (MLSS) allows you to support multiple start/stop RAN channels within the same RAN route and the individual RAN channel to each trunk route number.

Start/stop immediate RAN

In the immediate (“level”) start RAN, the leading edge of the start signal initiates message playback that continues until either the trailing edge of the start signal occurs or the end of the message is reached. A message that is terminated by the trailing edge of a level start signal is immediately reset and again made available for playback. To configure the RAN route, load LD 16 using the system TTY and respond to the prompts as shown in Table 13 with the appropriate parameter selection for your application.

Table 13
Defines an immediate start or start/stop RAN route

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number
TKTP	RAN	Trunk type recorded announcement (RAN)
RTYP	LVL	Level start/stop mode.
REP	1-15	Number of repetitions of RAN
POST	ATT DIS	Route to attendant after maximum repetitions Disconnect after maximum repetitions
STRT	IMM	Immediately connect call to recorded announcement
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Music-on-hold activation and route selection

Music-on-hold (MOH) operates in a continuous mode with an immediate connection of the music source, which plays constantly. Callers “barge in” on playing music.

To specify the conference loop for the MOH, you have to access the Configuration Record program LD 17, as shown in Table 14.

Table 14
Add or change conference loop for MOH

Prompt	Response	Description
REQ	CHG	Define change existing configuration
TYPE	CFN	Configuration record
CEQU	Yes (No)	Change common equipment parameters
XCT	0-158	Loop number for NT8D17 Conference/TDS card.
CONF	0-158	Conference loop should be an even number.

To configure the RAN route, load Route Data Block program LD 16 using the system TTY and respond to the prompts as shown in Table 15 with the appropriate parameter selection for your application.

Table 15
Defines music-on-hold route

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number
TKTP	COT, MUS	Trunk type 'for RAN
MUS	Yes (No)	Music-on-hold
_MRT	0-511	Music route number
STRT	IMM	Immediately connect call to music-on-hold
ICOG	OGT	For music-on-hold select outgoing trunk only
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Configuring telephone set-based OA&M access

To configure MIRAN for telephone set-based OA&M access using internal one-to-one port/channel 7, you have to configure the appropriate route and trunk data blocks. Table 16 lists Route Data Block program LD 16 commands to define the route data block for the port/channel 7 used for telephone set-based OA&M access. For a configuration example, refer to Appendix A, “DID configuration for telephone set-based OA&M access” on page 181.

Table 16
Configuring telephone set-based OA&M access route

Prompt	Response	Description
REQ	NEW/CHG	Define new or change existing configuration
TYPE	RDB	Route data block
CUST	0-99	Customer number
ROUT	0-511	Route number
TKTP	DID	Trunk type for telephone set-based OA&M access
ICOG	IAO	Incoming and outgoing trunk
NEDC	ETH	Near end. Both ends have disconnect control
FEDC	ETH	Far end. Both ends have disconnect control
ASUP	NO YES CO	Do not return answer supervision Return answer supervision Return answer supervision if originator is a CO trunk
ACOD	xxx...x	Trunk route access code

Table 17 lists Trunk Data Block program LD 14 commands that allow you to configure the trunk data block for the telephone set-based OA&M access. For a configuration example, refer to Appendix A, “DID configuration for telephone set-based OA&M access” on page 181.

Table 17
Configuring the telephone set-based OA&M trunk data block

Prompt	Response	Description
REQ	NEW	New MIRAN trunk data block
TYPE	DID	Type of trunk. Set MIRAN port 7 to DID for telephone set-based OA&M access
TN	l s c u	MIRAN loop, shelf, card slot and port. For telephone-based OA&M select MIRAN port 7
CDEN	8D	Card density of 8 ports
XTRK	EXUT	Extended trunk type for telephone set-based OA&M access
TRK	ANLG	Analog trunk
SIGL	LDR	Signaling. Loop dial repeating
CUST	0-99	Customer number defined in LD 15 and prompted when REQ= NEW
RTMB	0-127	Route number
BIMP	600, 900	Balanced trunk impedance for MIRAN
STRI	DDL, IMM	Incoming trunk starting arrangement

Configuring the MIRAN trunk characteristics

After you have configured the route, you can now configure the trunk characteristics. A trunk data block specifies the parameters for a particular trunk. Since the MIRAN is emulating the Enhanced Universal Trunk card, you can define the MIRAN parameters using the Trunk Administration program LD 14 on the system TTY and respond to the prompts as shown in Table 18 to configure the MIRAN data block.

Table 18
Configuring the MIRAN trunk data block for RAN and MOH

Prompt	Response	Description
REQ	NEW	New MIRAN trunk data block
TYPE	MUS, RAN, DID	Type of trunk; music or RAN Set MIRAN port 7 to DID for telephone OA&M
TN	I s c u	MIRAN loop, shelf, card slot and port. For telephone-based OA&M select MIRAN port 7
CDEN	8D	Card density of 8 ports
XTRK	EXUT	Type of trunk Enhanced Universal or E&M
SIGL	LDR	Signaling for battery or loop outpulsing for telephone-based OA&M over MIRAN port 7
CUST	0-99	Customer number defined in LD 15 and prompted when REQ= NEW
RTMB	0-127	Route number
BIMP	600, 900	Balanced trunk impedance for MIRAN
STRI	DDL, IMM	Incoming trunk starting arrangement
CFLP	0-159	Music conference loop

Configuring Option 11C pass-through mode

To be able to use the MIRAN maintenance terminal as a system TTY in Options 11C, you must configure the terminal parameters using the Configuration Record program LD 17 as shown in Table 19:

Table 19
Option 11C pass-through configuration

Prompt	Response	Description
ADAN	NEW TTY 1	Add system terminal TTY 1
TTY_TYPE	LSL	Terminal type
CAB	0	Cabinet number
CARD	0	SDI card position (Note)
PORT	1 (or 2)	SDI port selected (Note)
DES	MIRAN	Card name (Meridian Integrated RAN)
FLOWTYPE	NONE	Interface flow control
BPS	9600	Interface transmission speed
BITL	8	Word length - 8 bits
STOP	1	Stop bit
PARY	NONE	Parity
Note: To connect an MSDL SDI port to the Option 11E/11C SDI connector, refer to the <i>Installation</i> chapter of the <i>Multi-purpose Serial Data Link description</i> (553-3001-195)		

To access the MIRAN, type the prompt 'AX<space>[port number]'. Press Enter twice to display the MIRAN OA&M screen on the maintenance terminal.

To return to the system TTY mode, type <CTRL>] and the control will be passed back to the Meridian 1 system.

Configuring Option 11C for CEMUX access

To be able to use the MIRAN maintenance terminal as a system TTY in Options 11C over the CEMUX, you must configure the terminal parameters using the Configuration Record program LD 17 as shown in Table 20.

Table 20
Option 11C CEMUX access configuration

Prompt	Response	Description
REQ	CHA	Change data
TYPE	CFN	Configuration record
ADAN	NEW TTY 3	Add new TTY
TTY_TYPE	LSL	Low speed AUX link
CAB	0	Main cabinet
CNDO	03	Card slot
PORT	0	MIRAN port
DES	MIRAN	Port or link designation
FLOWTYPE	NONE	Flow control
BPS	9600	TTY speed
BITL	8	Number of bits
STOP	1	Stop bit
PARITY	NONE	Parity bit
ENL		Enable MIRAN
To access MIRAN, at the prompt type; >ax y, where y is the TTY number. Example, >ax 3. To exit MIRAN, press the Ctrl + J.		

Configuring the terminal for terminal-based OA&M access

For a terminal-based OA&M access, you have to specify the VT-100 type terminal interface characteristics to ensure compatibility with the MIRAN RS-232 interface.

Set the interface parameters as follows:

- Transmission speed: 9600 bps
- Data bits: 8
- Stop bit: 1
- Parity: No
- Flow control: none

To administer RAN applications using the terminal, go to “RAN Application: Terminal-based OA&M” chapter in this manual.

If using a Window[™] based terminal emulator, you should disable the CTRL and the arrow keys by Windows[™] because these keys are used by the OA&M for traversing the menus.

MIRAN administration

As part of the administration tasks, you may have to upgrade RAN applications and perform backups. The upgrades can be:

- storage capacity expansion
- channel capacity expansion

RAN application security

There are several levels of access to the MIRAN card for the RAN application. This is to ensure the security of all announcements recorded.

The password protection for telephone set-based OA&M will be transparent to the system in which the MIRAN card is installed. In order to provide security, two levels of passwords are used. The distributor and the user levels.

The distributor level password can be alphanumeric of up to 16 characters long. The user password must be only numeric and up to 16 digits long.

Distributor level password

The distributor default password is “**4321**”. The distributor is able to access the base code self-test and diagnostic procedures. Also, this password level provides message monitoring for Card-LAN, DS-30X, and CE-MUX, 8051 signals.

User password

The user default password is “**4321**”. The general OA&M password allows a user to login to the MIRAN administration menu, check the status of the card and display the recorded announcements in service and in reserve. The first level of access will in addition allow the user to swap announcements in and out of service. The second level of access will in addition again allow the user to record and configure recorded announcements.

Software security

To provide security for the RAN and music applications as well as to prevent unlawful product usage, the MIRAN uses the security device and keycode security approach.

Security overview

A security device and keycode mechanisms are needed to protect against unlawful MIRAN feature usage. All upgrades of either port capacity or application software are restricted to a given MIRAN card and are accurately tracked to allow for satisfactory handling of field repairs and incremental upgrades.

A new keycode is required for the following upgrades:

- port capacity upgrades; two are possible:
 - from one multi-cross connect channel to two
 - from four one-to-one ports/channels to eight
- feature enhancements
- new applications

Security is not required for the following upgrades:

- Voice and music storage capacity expansion
- customer recorded announcements

- backup and restore operations
- application patching/bug fix

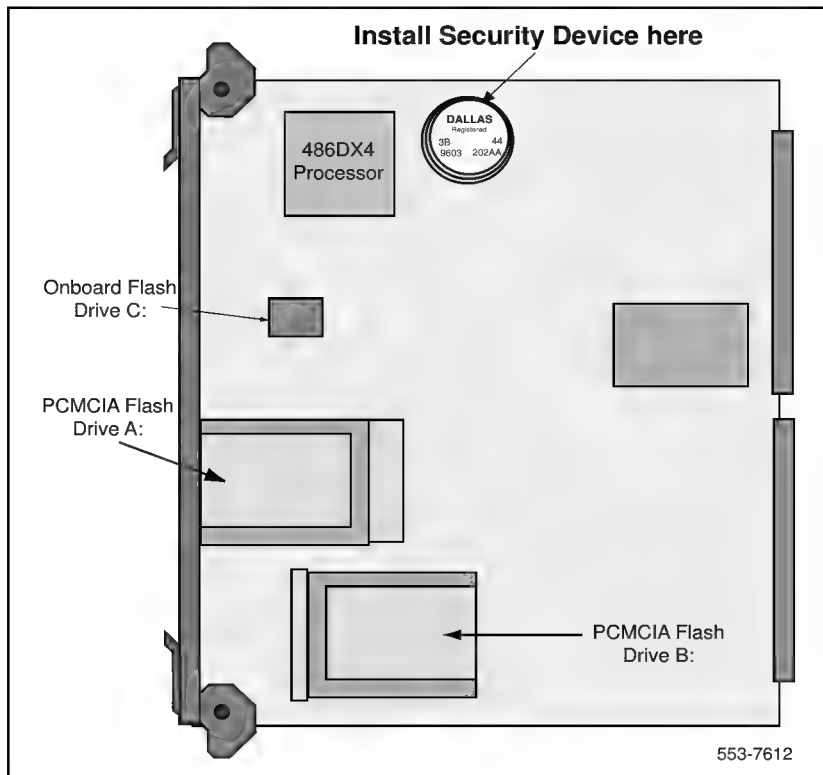
Security device

This button-sized device has a unique 8-digit security ID that cannot be overwritten. In addition, it contains 1kbit of PROM to:

- identify the button as part of a Nortel product
- act as a store for any upgrades previously performed on the MIRAN card

Figure 18 shows the position of the security device and the on-board PCMCIA Flash card.

Figure 18
Security device installation location



Security ID

The security ID is an 8-digit number used to uniquely identify the MIRAN card. It is stored on the PROM on the card.

The security ID can be found:

- at the top left-hand corner of the terminal-based OA&M menu or screen
- by using a command on the telephone set-based OA&M access
- on the shipping paperwork or box
- a sticker label on the card

To upgrade a MIRAN, the customer provides Nortel with the security ID of the original card and Nortel provides the customer with a matching keycode.

Keycode

Nortel provides the customer with a keycode to enable them to install any purchased upgrades. The keycode is entered over the local maintenance port on the MIRAN card. The code consists of a stream of 24 digits that matches the Security ID of the MIRAN being upgraded.

When the MIRAN is ordered with a new Meridian 1 (Options 51C through 81C), the keycode is pre-loaded by the factory into the MIRAN. Option 11E or 11C and stand-alone orders of the MIRAN, require that you enter the keycode using a VT100 type terminal.

Keycodes can enable additional functionality within an existing application (adding ports, features, etc.) or can be used with a PCMCIA Flash card to provide new software or pre-recorded announcements.

The keycode must contain the security device information to be compatible with the specific MIRAN to enable the upgrade. If there is a mismatch, the upgrade cannot be activated.

RAN installation

Various recorded announcements are recorded and assigned to the required RAN one-to-one ports/channels over the RAN OA&M application. One announcement may be assigned to several ports to let the MIRAN card know which announcement is to be played when a particular MIRAN port is seized. To play the same announcement over several trunks on the same route, you must use multi-channel level start/stop control RAN mode.

The different ports/channels on the card are configured as either immediate start or delay start to allow the MIRAN card to match system configuration options to each trunk port. Finally, corresponding routes and Enhanced Universal Trunk cards are defined on a system level. Refer to “MIRAN configuration” on page 62 in this chapter.

If the same recorded announcement is required on more than one MIRAN card, then it must be installed separately on each card by backing up to PCMCIA Flash on one card and restoring on the remaining cards.

Real time clock setup

The MIRAN real time clock is set up using the MIRAN administration menu (refer to “RAN Application: Terminal-based OA&M” on page 107). The craft person should set the clock to match the system clock. This should be done before starting RAN configuration.

The MIRAN clock has battery backup in case of power reset. In addition, the clock is used to timestamp entries in various log files on the card, and to switch between “day-time” and “night-time” announcements.

Telephone set-based OA&M

If the telephone set-based administration is needed, then you must configure the MIRAN port/channel 7 for this purpose. Because the telephone set-based OA&M port/channel 7 is originally available for general RAN functions, you must define it as a DID trunk port. A all numeric password is required to use the telephone set-based OA&M access. Port/channel 7 is also available for telephone set-based OA&M access in small and medium size MIRAN cards.

Note: Make sure that the keycode has been loaded into the MIRAN using a VT100 type terminal (if not already loaded in the factory), before you attempt to use telephone set-based OA&M access.

First define the port on the card as a DID trunk, then define the corresponding route and the access code at the system level. This port is then restricted to telephone set-based OA&M and cannot be used to play recorded announcements or music. For configuration details, refer to “Configuring telephone set-based OA&M access” on page 69 and configuration example in Appendix A, “DID configuration for telephone set-based OA&M access” on page 181.

Access the OA&M application by dialing the DID trunk access code and entering the password. After the password is entered, the voice menu becomes available. Refer to Table 16 for LD 16 prompts and Table 17 for LD 14 prompts.

Terminal-based OA&M

The MIRAN terminal-based or text-based interface is provided for the RAN OA&M over the direct connection to a terminal or PC. It is also available indirectly, using the STA (Single Terminal Access) feature on the Multi-purpose Serial Data Link (MSDL) card. Refer to “RAN Application: Terminal-based OA&M” on page 107.

MIRAN card administration

The following tasks may be performed by the RAN application, using the RAN administration menu on the MIRAN card using terminal-based OA&M access:

- Recording announcements.
- Changing recorded announcements between different MIRAN ports/channels.
- Swapping recorded announcements between “in service” and “in reserve”.
- Adding additional memory resources.
- Upgrading MIRAN applications using PCMCIA card.

The following MIRAN tasks are **not** available over the telephone set-based OA&M; due to their complexity, they are **only** available over a terminal-based OA&M:

- Uploading recorded announcements/music over the analog port on the MIRAN card faceplate.
- Uploading recorded announcements/music using a PCMCIA card.
- Connecting an analog source (e.g. CD player for music-on-hold) through the analog port on the faceplate.
- Cannot enter a keycode.
- Checking usage of the memory resource.
- Backing up MIRAN applications and/or announcements.
- Restoring MIRAN applications and/or announcements.
- Accessing various information files (e.g., security file, operational measurements file, etc.)
- Setting the MIRAN card clock.

MIRAN administration using a terminal

Use a VT-100 type terminal or a PC terminal emulator program under Windows to perform an OA&M session.

If multiple MIRAN cards are used in a single system, an OA&M terminal attached to one card can gain pass-through access to any other MIRAN card that is daisy-chained to the first (refer to Figure 15). Access a MIRAN card connected to the VLAN from the maintenance terminal.

For using the terminal-based OA&M access, refer to “RAN Application: Terminal-based OA&M” on page 107.

Telephone set-based MMI

After port/channel 7 on the MIRAN card is configured for the telephone set-based maintenance and the keycode has been loaded, then it is possible for the customer to access this channel from any telephone set and record any announcements required. This is done in the same manner as recording a personal greeting for Meridian Mail, for example.

To use a telephone set-based OA&M access, the following steps are required:

- 1** Assign channel 7 for telephone set-based OA&M access, refer to “OA&M Access Configuration” on page 142.
- 2** Record announcements using the telephone set, refer to “Telephone set-based OA&M flowcharts” on page 99.
- 3** Assigning recorded announcements to specific channels, time-of-day, and day-of-the-week; refer to “Assign Message” on page 118.

Note: If you assign a channel using the telephone set, all previous recording configurations for that channel are overwritten and replaced by the recording assigned through the telephone set.

For using the telephone set, refer to the section titled “RAN Application: Telephone set-based OA&M” on page 91.

Recording announcements and music

There are three different voice recording methods available to MIRAN customers:

- Access port/channel 7 (the maintenance port) over a DTMF telephone, and use the voice menu provided to record announcements that you speak into the telephone
- Use a PC with terminal emulation program and record to the PC over an RS-232 port
- Cable your portable tape or CD player directly into an audio port on the faceplate or MDF to record directly into the MIRAN.

Music can be recorded in the same manner as actual announcements. The MIRAN can hold several minutes of music in Flash EPROM for use by features such as music-on-hold. Generally the music is downloaded to the MIRAN from an external analog source such as a tape recorder or a CD player. The music source is connected to the analog port of the MIRAN card. Connections are available on both the faceplate and the MDF.

PC-based recording

This is professional recording that can be provided to the user. An example of the system requirements to perform the recording and editing are:

- Windows™ environment
- Creative Labs AWE 32 Plug and Play audio card ModelCT3601, or equivalent
- PCMCIA Drive: DATABOOK ThinCard Drive Model TMB-240, or equivalent
- Software: GOLDWAVE sound editor, or equivalent

To perform the pc-based recording use one of the following methods:

- Use “.WAV” output of PC sound editor such as SoundBlaster™ or equivalent
- Convert from .WAV to raw A-law or U-law PCM (.ALW or .ULW file extensions should be used) using the sound editor
- Download to the MIRAN using PCMCIA
- Use the MIRAN utility to convert from .WAV to raw A-law or U-law PCM where the sound editor does not support this conversion feature

Note: When recording announcements, use the following recommendations. To remove sharp transitions at the boundaries of an announcement, add fade-in (from 0) at the start of the message and fade-out (to 0) at the end of message. Also, one second of silence must be added to the beginning and to the end of each message or clicking noise can be heard by the user.

The MIRAN professional recordings are first made on a third party PC sound editor that produces WAV files (.WAV is the Windows™ sound file standard). The best known of these editors is SoundBlaster™ Stereo Pro (16 bit sampling), comes with professional studio software for the manipulation of sound files subsequent to recording.

A specific sound editor is not recommended or supported by Northern Telecom. However, the format of the output file should be .WAV. Thus the choice of recording product will be at the discretion of the local distributor or end user.

After the files are edited in the PC, they can be downloaded to a PCMCIA card on the MIRAN in .WAV format. The PCMCIA card can then be inserted into the MIRAN.

You can use the Convert Message Files menu to convert the .WAV files into the .ALW or .ULW raw PCM files or vice versa, where .ALW corresponds to A-law and .ULW to U-law format. You can also convert .WAV files into the .SDN files and vice versa using the Convert Message Files menu in the terminal-based OA&M access mode.

Tape recorder and CD player recording

The .ALW or .ULW files are generated over the cross-connect channels using a recorder or a CD player. The recording supported is 8-bit PCM A-law or Mu-law mono sound.

Telephone set-based recording

The files are generated over the telephone set-based OA&M access are saved in .ALW or .ULW format based on the current system's coding/decoding law.

If you record a new message, it will be stored on the first available disk starting with B:, then A:, and finally C:.

If the message is stored on drive A: or B:, the message will be deleted unless you save it. If the message is stored on drive C: it is placed in RAM. If you save the message, the message is recorded in Flash on drive C:. Message saving is a slow process (takes about as long as it takes to record it).

CAUTION

When writing to the drive C:, MIRAN ports/channels should be idle except for channel 7, which is used for telephone set-based OA&M access. If message playing is allowed at this time, the messages playback quality may be poor, or the MIRAN card may re-boot.

Music sources

Music can be accessed by two methods, both externally and internally. Both of these methods may be used at the same time.

External music

In the case of external music, there is a permanent connection between an external music source (e.g. CD player, tape recorder etc.) and the MIRAN over the analog input port. This port is available both at the MDF and also on the MIRAN faceplate. External music is the most suitable implementation in cases where there is a requirement to frequently change the music.

The analog input is obviously not confined to music and can be used in many applications e.g. a “talking timetable”, or perhaps advertisements, which are changed on a regular basis. This type of implementation would generally be found on the larger system options where it is acceptable to have a dedicated piece of audio equipment for this purpose.

Internal music

Internal music is normally used in situations where it is not possible or desirable to have a music source permanently connected to the MIRAN. In this situation, a craftsperson uses an external music source to record the music onto the MIRAN, where it is stored digitally in Flash memory.

If more than 4 minutes of storage is required, a PCMCIA card is required.

Card-level administration

The card-level administration is used to re-record or re-assign messages to channels based on traffic statistics. Refer to “RAN Application: Terminal-based OA&M” on page 107.

Altering an assigned message: option 1

Disable any units to which the message is assigned, unassign the message, delete the message, and record a new message that can be re-assigned.

Replace and old message: option 2

Record and swap a new message between active calls to avoid disturbing service; then, delete the old message. This method assumes sufficient free storage to allow recording the new message without deleting the old one.

Command files

The MIRAN can accept downloaded command files that are similar to DOS batch files. Command files are used to store configuration information during backup and restore operations. The PCMCIA Flash card stores command files along with voice files. Entered on the terminal or downloaded, backup information can be edited on a PC capable of reading ATA-compatible PCMCIA cards. Refer to *Command summary* menu in “RAN Application: Terminal-based OA&M” on page 107.

Utilities that can edit messages are simple text files, such as DOS EDIT or Windows Notepad, can also edit command files. It is not necessary to type configurations individually into each MIRAN, because customer configurations can be generated on a PC and copied to multiple MIRAN cards on the same RAN route.

RAN upgrades

Several types of RAN application upgrades are available on the MIRAN card. These are:

- a software upgrade for bug fix and/or addition of new features
- a memory upgrade to increase the voice storage capacity
- a memory upgrade to add new pre-recorded announcements / music
- a mixture of the above

To perform and RAN upgrade:

- 1 Insert a PCMCIA card into the A: slot on the MIRAN faceplate.
 - If the new PCMCIA card contains a configuration file, the MIRAN executes this file to perform the upgrade automatically. This configuration file can be prepared in the distributor's office for each MIRAN customer and then placed on the PCMCIA card along with the application and/or recorded announcements to be upgraded. Then, the PCMCIA card is sent to the customer, who only has to insert the PCMCIA card in the MIRAN card to perform the upgrade.
 - If the new PCMCIA card contains a feature upgrade but no configuration file, the MIRAN card can perform the upgrade without any intervention by the craftsperson.
 - After the feature upgrade configuration is completed, enter the new keycode on the MIRAN terminal to activate new features you just installed.
 - For the new feature to become active, you must perform a hard reset.
- 2 If the PCMCIA card contains .WAV sound files but no configuration file, you have to establish a administration session, as described in this step, in order to perform the upgrade and configuration of file assignments.

To replace old announcement files with new files on the PCMCIA:

- Display existing (old) files using the List Files menu "List Files" on page 133.
- Delete the files you wish to replace with new files on the PCMCIA card, by using the "Delete File" on page 136.
- Copy new files from PCMCIA card into the drive where your other announcement files are located, by using the "Copy File" on page 135.
- Convert files from .WAV to .ULW or .ALW or vice versa, if required, by using the "Convert Message File" on page 124.
- Professionally recorded prompts must be in .WAV, .ALW, or .ULW format. For recording announcement files, refer to *Appendix A, Sound recording configuration*.

- 3 To configure the announcement file assignment, you have to assign the day/time and channel when and where this file will be played. To do this, use the “Assign Message” on page 118.
- 4 If a PCMCIA card contains both a feature and recorded announcement upgrade but has no configuration file, the MIRAN circuit card performs the feature upgrade automatically.
 - Perform the recorded announcement upgrade as in step 3 of this procedure.
 - After the configuration is completed, enter the new keycode on the MIRAN terminal to activate new features you just installed.
 - For the new feature to become active, you must perform a hard reset.

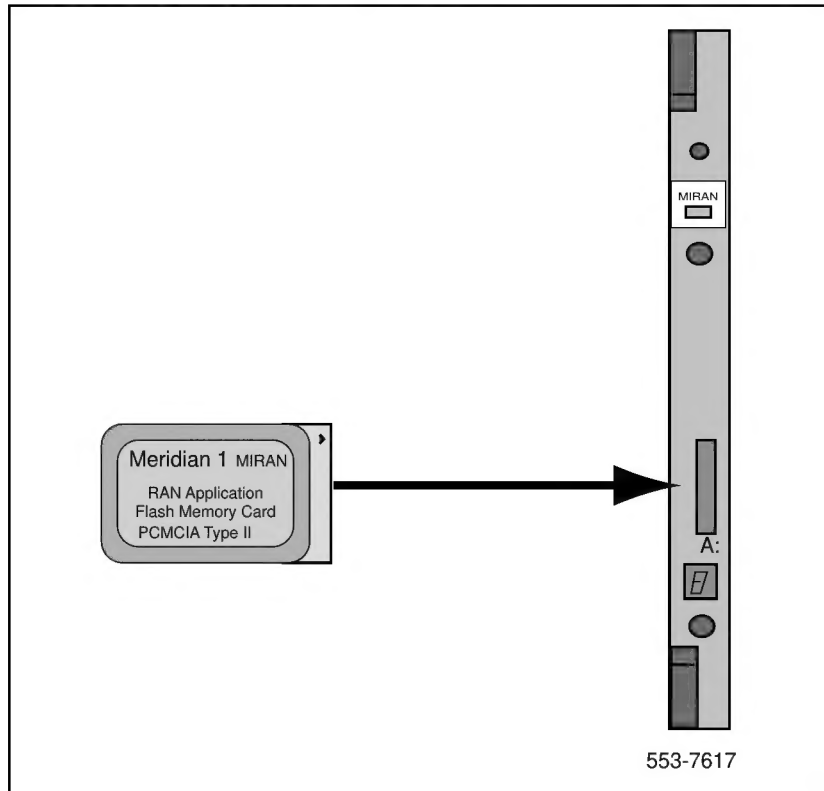
Software upgrade

Perform a software upgrade:

- 1 Insert the new feature PCMCIA card into the drive A: slot on MIRAN, as shown in Figure 19.
- 2 Initiate the upgrade by using the “Software Upgrade” on page 140. The MIRAN copies across the new application while maintaining all files from the existing ATA Flash memory that are still needed (i.e. existing recorded announcements and configuration). Once the upgrade is complete, remove the old Flash card, unless it is needed to provide additional storage capacity.
- 3 Keycode requirement:
 - If the software upgrade is a maintenance type (bug fix etc.), new keycode is not needed.
 - If the upgrade consists of a new application or enhancement, the administrator must enter a new keycode on the maintenance terminal to enable the upgrade.
 - For the new feature to become active, you must perform a hard reset.

Figure 19 shows the MIRAN faceplate and the PCIMCIA card slot.

Figure 19
MIRAN software upgrade



Increasing voice storage

You can increase voice storage capacity to the maximum amount available on commercially available PCMCIA memory cards (up to 5 hours).

To expand the message storage capacity, insert a blank PCMCIA Flash card into the A: slot on the faceplate. The MIRAN software checks the Flash card for formatting information. If none exists, the MIRAN will proceed to format the card in DOS format. When completed, the full capacity of the card will be available for storage. To expand voice storage, use the on-board slot B:

Backups

Backup of recordings is not necessary because the Flash technology used on the MIRAN is very reliable. However, backup is available to a PCMCIA memory card, if needed.

The configuration must be backed up. To backup the configuration, refer to “Backup Configuration” on page 127.

PCMCIA backup

Insert a blank PCMCIA card into drive A: just as if you were increasing the voice storage capacity. Before beginning to record any additional messages to this Flash, initiate an OA&M session and select the backup to PCMCIA option or use the **BACKUP** command.

The drive A: is checked for the BACKUP.DAT file before checking drive C:. If the file exists on the PCMCIA card in drive A:, the system will retrieve the configuration from this drive rather than the BACKUP.DAT file in drive C:. For details, refer to the *RAN Application: Terminal based OA&M* and *Telephone set-based OA&M* chapters in this document. The new card is now available as a backup medium rather than as a storage medium.

If you attempt to backup to a non-blank card, the existing files will be overwritten.

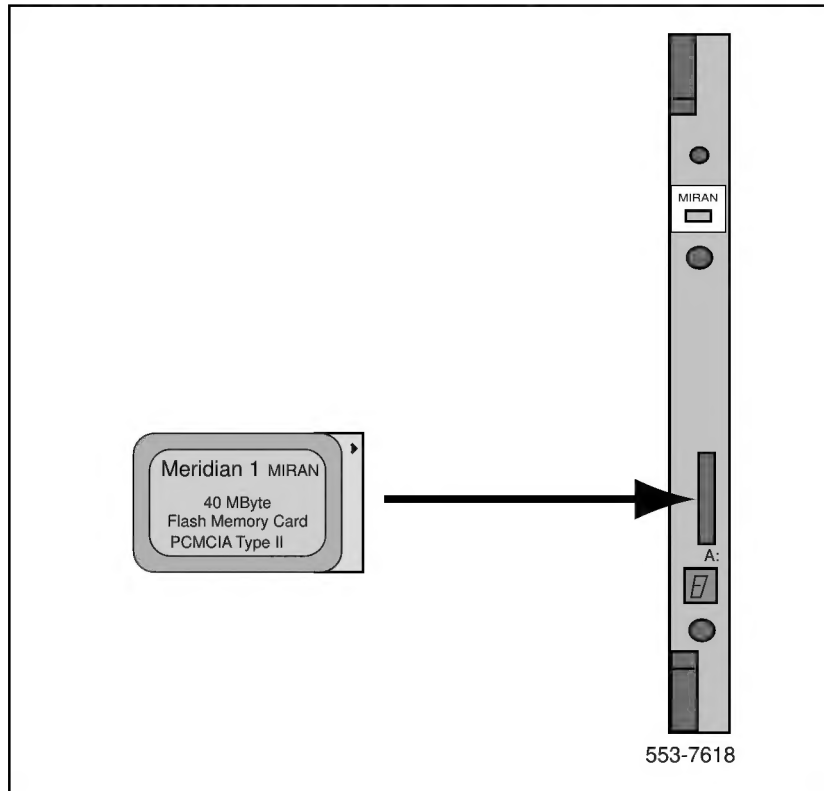
Note: When backing up recordings and configuration, you must define the drive you wish to use for backup.

A backup includes both recorded announcements and configuration. The configuration contains information relating to the RAN/music PCM data stored in Flash that includes:

- voice files
- announcement-to-channel allocation
- external/internal music selection
- passwords
- RS-232 port settings

Figure 20 illustrates backing up recordings by using a Flash Memory card.

Figure 20
Backup of MIRAN configuration/recordings



Restoring configuration

When you re-boot MIRAN, the MIRAN configuration is restored from the disk using the following sequence; first drive A: then drive B: and finally drive C:. This allows a previously stored configuration to be over-written by installing an ATA card in drive A:, which contains a new BACKUP.DAT file that has been saved on a different MIRAN card.